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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
BOYLE, ROBERT C				
ART UNIT		PAPER NUMBER		
4131				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/582,089

Applicant(s)

GIACOBBI ET AL.

Examiner

ROBERT C. BOYLE

Art Unit

4131

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 May 2007.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-16 is/are rejected.
7) ☒ Claim(s) 1 and 9 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 08 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-850)
Paper No(s)/Mail Date 09/06/2006, 11/20/2006
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claims 1 and 9 are objected to because of the following informalities: the phrase "crosslinked (cured)" is used. As used in this application, the terms 'crosslinked' and 'cured' are synonymous, and therefore only one of the terms is necessary. Please remove the other.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. The term "high" in claim 16 is a relative term which renders the claim indefinite. The term "high" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The term "high" modifies the phrase "temperature".

5. The term "quality" in claim 16 is a relative term which renders the claim indefinite. The term "quality" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The term "quality" modifies the shaped products in line 2 of claim 16.

6. Claim 16 recites the limitation "the quality" in claim 16. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fritz et al., *Sensor Development and Process Control in the Field of Polymer Compounding*, Nondestructive Characterization of Materials IV, edited by Ruud et al., Plenum Press, NY, 1991, in view of Bambara et al., U.S. Patent 5,883,144.

9. Claim 1 discloses a process for producing a silane crosslinked polyethylene where a silane is grafted onto a polyethylene and then crosslinked with a polyethylene. The process comprises the steps (a) removing a sample before the crosslinking, (b) making the sample into a film, (c) analyzing the film by IR, (d) predefining an area of the IR spectra, and (e) correlating the area with the gel content using a regression curve.

10. Fritz teaches graft polymerization of polyethylene with organosilanes (page 122, last paragraph) crosslinking the polymers (page 123, first paragraph), where a sample has been subjected to IR spectroscopy before crosslinking focusing on a portion of the IR spectra (page 123, last paragraph). Fritz does not teach correlating with the gel content or making a film.

11. Bambara teaches one parameter for quantifying the degree of crosslinking is the gel content of the composition (column 16, lines 50-61) and the formation of films (column 18, line

64). One of ordinary skill in the art would recognize that the degree of crosslinking is directly related to the amount of crosslinking agents grafted to the polymer, which is quantified by the IR spectra.

12. One of ordinary skill in the art at the time the invention was made would have been motivated to modify the measuring process in Fritz with the silane grafted polyethylene taught in Bambara because Bambara teaches improvement in the crosslinking behavior and using silane crosslinking to allow previously unsuitable polyolefins in foaming applications (see Bambara: column 4, lines 62-67; column 5, lines 19-43). Therefore, the invention as a whole would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made.

13. Claim 2 discloses the polyethylene is a homopolymer or copolymer of ethylene. Bambara teaches using polyethylene resins (column 9, lines 26-30).

14. Claim 3 discloses other monomers, including butene. Bambara teaches using ethylene/butene copolymers (column 9, lines 26-30).

15. Claim 4 discloses the silane is a vinyl silane. Bambara teaches vinyltrimethoxysilane (column 13, line 20).

16. Claim 5 discloses silanes, including vinyltrimethoxysilane. Bambara teaches vinyltrimethoxysilane (column 13, line 20).

17. Claim 6 discloses the predefined area of the IR spectrum starts between 1150-1205 cm^{-1} and ends at 1000-1085 cm^{-1} . Fritz teaches observation of the $\gamma(\text{Si})\text{-O-C}$ oscillation peak at 1080 cm^{-1} (page 123, last paragraph; page 124, Fig. 3).

18. Claim 7 discloses the grafting of the silane occurs in the presence of a free radical source. Bambara teaches using peroxides to graft silanes to the polymers (column 11, lines 31-42; column 12, line 10).
19. Claim 8 specifies free radical sources, including peroxide. Bambara teaches using peroxides to graft silanes to the polymers (column 11, lines 31-42; column 12, line 10).
20. Claim 9 discloses the crosslinked polyethylene is part of a shaped product. Bambara teaches the polymer is molded into a shape (column 18, lines 20-34).
21. Claim 10 discloses the polyethylene is reacted with a free radical source and the silane to obtain granules and the granules are formed into a shape which is then cured by heat and water. Bambara teaches granules (column 18, lines 20-32) and curing by hot water (column 13, lines 22-25).
22. Claim 11 discloses the sample removed before crosslinking is polyethylene. Bambara teaches using polyethylene resins (column 9, lines 26-30).
23. Claim 12 discloses how to obtain the regression curve: (A) produce samples varying concentration of silane, (B) produce samples varying concentration of free radical source, (D) cure the samples and measure gel content, (E) subject samples to IR, (F) subtract the spectra with a sample that had no silane and normalize, (G) determine a predefined area of the spectra, and (H) correlate the areas with the gel content.
24. Fritz teaches samples of varying concentration of silane (page 124, Fig. 3) and varying concentration of peroxide (page 124, Fig. 4), subjecting the samples to IR spectroscopy and examining specific peaks of the spectra (page 124, Fig. 3 and Fig.4). Bambara teaches curing and measuring gel content which is correlated to the degree of crosslinking (column 16, lines 50-61).

Fritz does not teach subtracting the spectra with a sample that has no silane and normalizing.

However, one of ordinary skill in the art would have known to do this because this is the use of a known technique to obtain predictable results. Subtracting two spectra and normalizing the result is a known technique to obtain a predictable result, the result being a spectra that shows the differences between the two original spectra.

25. Claim 13 discloses that one sample has a silane concentration of zero percent and that five or more samples are produced. Fritz teaches five samples, one of which has no silane (page 124, Fig. 3).

26. Claim 14 discloses five or more samples of varying concentrations of free radical source are produced. Fritz teaches four samples of varying concentrations (page 124, Fig. 4). Fritz does not teach using five or more samples, however, one of ordinary skill in the art would have known to use five because five samples were used for the other variable, the silane (page 124, Fig. 3 and Fig.4).

27. Claim 15 discloses a step (C) is carried out with five or more samples. Step (C) uses samples of varying concentration of silane and varying concentration of free radical source. Fritz discloses varying concentrations of silane and varying concentrations of the free radical source (page 124, Fig. 3 and Fig.4).

28. Claim 16 discloses a method for controlling the quality of shaped product comprising the steps (a) removing a sample before the crosslinking, (b) making the sample into a film, (c) analyzing the film by IR, (d) predefining an area of the IR spectra, and (e) correlating the area with the gel content using a regression curve.

29. Fritz teaches graft polymerization of polyethylene with organosilanes (page 122, last paragraph) crosslinking the polymers (page 123, first paragraph), where a sample has been subjected to IR spectroscopy before crosslinking focusing on a portion of the IR spectra (page 123, last paragraph). Fritz does not teach correlating with the gel content or making a film.

30. Bambara teaches that controlling the quality of the product is desirable (column 1, lines 61-67). Bambara teaches one parameter for quantifying the degree of crosslinking is the gel content of the composition (column 16, lines 50-61) and the formation of films (column 18, line 64). One of ordinary skill in the art would recognize that the degree of crosslinking is directly related to the amount of crosslinking agents grafted to the polymer, which is quantified by the IR spectra.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT C. BOYLE whose telephone number is (571)270-7347. The examiner can normally be reached on Monday-Friday 9:00am - 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571)272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/
Supervisory Patent Examiner
Art Unit 4131

/R. C. B./
Examiner, Art Unit 4131